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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/705,661	11/03/2000	Kazuto Okazaki	4296-123	6250

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EXAMINER	
RIDLEY, BASIA ANNA	

ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/705,661	OKAZAKI ET AL.	
	Examiner	Art Unit	
	Basia Ridley	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8,9,14 and 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8,9,14 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 November 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. In amendment filed on 18 November 2004 claims 10-13 were cancelled, as shown by the claim listing, even though first paragraph on page 9 of said amendment states that only claims 11-13 were cancelled.

Drawings

2. The drawings were received on 18 November 2004. These drawings are not acceptable for the following reasons:

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because Fig. 2-3 include the following reference character(s) not mentioned in the description: 101.

The drawing(s) is/are objected to as failing to comply with 37 CFR 1.84(q) because Fig. 2 contain(s) a lead line without corresponding reference number.

The drawing(s) are objected to as failing to comply with 37 CFR 1.84(q) because reference characters 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111 and 112 in Fig. 2-3 are lacking lead lines between themselves and the details which they are referring to. It is not always clear which process line is indicated by which reference number.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement

Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:

- paragraph beginning on page 16, line 13 through page 17, line 9 (see lines 12-13 and 17 of said paragraph as amended on 18 November 2004) "line 7", "line 8", "line 6", and "line 9" should be replaced with --line 107--, --line 108--, --line 106--, and --line 109--, respectively;
- paragraph beginning on page 17, line 10 through page 18, line 13 (see lines 17 and 19 of said paragraph as amended on 18 November 2004) "line 3" and "line 9" should be replaced with --line 103-- and --line 109--, respectively;
- paragraph beginning on page 18, line 20 through page 19, line 3 (see line 9 of said paragraph as amended on 18 August 2003) "line 6" should be replaced with --line 106--;
- paragraph beginning on page 26, line 16 through page 27, line 15 (see lines 5 and 12-18 of said paragraph as amended on 18 November 2004) "line 11", "line 11", "line 2", "line 11", "line 11", "line 2", "line 12", "line 12", and "line 12" should be replaced with --line 111--, --line 111--, --line 102--, --line 111--, --line 111--, --line 102--, --line 112--, --line 112--, and --line 112--, respectively;
- paragraph beginning on page 29, line 15 through page 29, line 25 (see line 3 of said paragraph as amended on 18 November 2004) "line 2, 3, and 11," should be replaced with --line 102, 103, and 111,--.

Appropriate correction is required. Applicant is reminded that no new matter shall be added.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claim(s) 8-9 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art (as shown in Fig. 1 of instant specification and as described on P1/L15-P5/L29) in view of Oswalt et al. (USP 4,769,998).

Regarding claim(s) 8-9, Admitted Prior Art disclose(s) similar apparatus for production of acrylic acid or acrolein comprising:

- a catalytic gas phase oxidation reactor (4);
- an evaporator (3) for gasifying liquefied propylene and/or propane (14);
- means (24) for supplying a coolant (17) to said evaporator (3);
- means (3) for chilling the coolant (17) in the evaporator (3) by recovering latent heat of the liquefied propylene and/or propane (14) (P3/L19-25);
- means for subjecting resultant gasified propylene and/or propane to said catalytic gas phase oxidation reactor (4) thereby preparing a gas containing acrylic acid or acrolein (Fig. 1);
- wherein said means (3) chilling the coolant (17) includes means (24) for adjusting the temperature of said coolant (17) or means for adjusting a flow amount thereof (Fig. 1).

Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said apparatus comprises various heat exchangers which use a liquid coolant (Fig. 1 and P2/L24-P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler (9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a

condenser (11) attached to the acrylic acid refining column (7). The reference does not explicitly disclose that said chilled coolant can be used in said heat exchangers in the apparatus and later re-circulated back to the evaporator.

Oswalt et al. teaches that it is known to prepare a process coolant, which can be used as a coolant in heat exchangers in various processes (C1/L9-19), by passing a liquid coolant through an evaporator (6). Chilled coolant from said evaporator (6) is used in various processes and spent process coolant is being re-circulated back to the evaporator (6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a liquid coolant in the evaporator of Admitted Prior Art to prepare a chilled coolant and to use said chilled coolant in the heat exchangers in the apparatus for production of acrylic acid or acrolein, as taught by Oswalt et al., for the purpose improving operation efficiency. Said modification would merely amount to using an available coolant rather than a coolant which has to be prepared in auxiliary process, therefore saving an operation cost of said auxiliary process.

While the references disclose that said coolant can be used to control temperature of various processes, including chemical reactions (Oswalt et al. C1/L9-19 and C6/L63-32), the references do not explicitly disclose any specific temperatures for liquid coolant before or after said coolant is passed through the evaporator. As the temperature at which chemical reactions are being conducted is a variable that can be modified, among others, by adjusting the temperature of coolant used to remove heat from said chemical reactions, with said reactions temperature decreasing as the temperature of the coolant is decreased, the precise temperature of the coolant (at any point of the process) would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed

coolant temperatures cannot be considered critical. Accordingly, one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the coolant temperatures at various process stages in the apparatus of Admitted Prior Art in view of Oswalt et al. to maintain the desired temperature of chemical reaction conducted in said apparatus (*In re Boesch*, 617 F.2d. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. (*In re Aller*, 105 USPQ 223).

Regarding claim(s) 14-15, Admitted Prior Art disclose(s) similar apparatus for production of acrylic acid or acrolein comprising:

- a catalytic gas phase oxidation reactor (4);
- an evaporator (3) for gasifying liquefied propylene and/or propane (14);
- means (24) for supplying a coolant (17) to said evaporator (3);
- means (3) for chilling the coolant (17) in the evaporator (3) by recovering latent heat of the liquefied propylene and/or propane (14) (P3/L19-25);
- wherein said means (3) chilling the coolant (17) includes means (24) for adjusting the temperature of said coolant (17) or means for adjusting a flow amount thereof (Fig. 1);
- means (4) for subjecting resultant gasified propylene and/or propane to a catalytic gas phase oxidation reaction thereby preparing a gas containing acrylic acid or acrolein (Fig. 1);
- means for adjusting pressure of the evaporator (3) for gasifying liquefied propylene and/or propane (14).

Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said

apparatus comprises various heat exchangers which use a liquid coolant (Fig. 1 and P2/L24-P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler (9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a condenser (11) attached to the acrylic acid refining column (7). The reference does not explicitly disclose that said chilled coolant can be used in said heat exchangers in the apparatus and later re-circulated back to the evaporator.

With respect to Oswalt et al. the same comments apply as set forth above.

Regarding limitations recited in claim 15 which are directed to a manner of operating disclosed apparatus (such as recited specific pressure range), neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations (such as recited specific pressure range), do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Response to Arguments

7. Applicant's arguments filed 18 November 2004 have been fully considered but they are not persuasive.

8. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

9. The applicant argues that the disclosure of Oswalt et al. does not teach an evaporator for gasifying liquefied propylene and/or propane as raw material of acrylic acid or acrolein. This is not found persuasive. The Admitted Prior Art discloses that a coolant supplied to said evaporator is chilled by evaporating liquefied propylene and/or propane (Fig. 1) and the reference discloses that said apparatus comprises various heat exchangers which use a liquid coolant (Fig. 1 and P2/L24-P3/L18), such as an absorbing solvent cooler (8) and a circulation cooler (9) attached to the acrylic acid absorbing column (5), a condenser (10) attached to the solvent separating column (6) and a condenser (11) attached to the acrylic acid refining column (7). Oswalt et al. teaches that it is known to prepare a process coolant, which can be used as a coolant in heat exchangers in various processes (C1/L9-19), by passing a liquid coolant through an evaporator (6). Chilled coolant from said evaporator (6) is used in various processes and spent process coolant is being re-circulated back to the evaporator (6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a liquid coolant in the evaporator of Admitted Prior Art to prepare a chilled coolant and to use said chilled coolant in the heat exchangers in the apparatus for production of acrylic acid or acrolein, as taught by Oswalt et al., for the purpose improving operation

efficiency. Said modification would merely amount to using an available coolant rather than a coolant which has to be prepared in auxiliary process, therefore saving an operation cost of said auxiliary process. One of ordinary skill in the art would recognize that a chilled coolant can be used in various heat exchangers, without changing the principles of operation of the main process which involves said heat exchangers, and therefore, when looking for modification to heat exchangers, to either save operation cost or improve operation efficiency, one of ordinary skill in the art would utilize teachings regarding said heat exchange operation which can be found in various applications, and not just in one specific application, such as production of acrylic acid or acrolein.

10. In response to applicant's argument that propylene or propane can not be used in the system of Oswald et al. because it has possibility to explode when it is mixed with air in the specific ration is not clear, as Oswald et al. does not suggest that air is added to the process stream being gasified in the evaporator. Further, the examiner notes that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant case, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a liquid coolant in the evaporator of Admitted Prior Art to prepare a chilled coolant and to use said chilled coolant in the heat exchangers in the apparatus for production of acrylic acid or acrolein, as taught by Oswalt et al., for the purpose improving operation efficiency. Said modification would merely amount to using an available coolant rather than a

coolant which has to be prepared in auxiliary process, therefore saving an operation cost of said auxiliary process, as set forth above.

11. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation for using the chilled coolant from evaporator of Admitted Prior Art as a cooling liquid in other heat exchangers in the process of Admitted Prior Art would be simple understanding of economics. One of ordinary skill in the art at the time of the invention knew that a process coolant, which can be used as a coolant in heat exchangers in various processes, can be prepared by passing a liquid coolant through an evaporator, chilled coolant from said evaporator can be used in various processes and spent process coolant can be re-circulated back to the evaporator (as evidenced by Oswalt et al.). In view of this knowledge one of ordinary skill in the art would realize that operation costs can be saved if a cooling capacity already present in the process is used (by using a chilled coolant prepared in the evaporator) rather than by using an additional coolant prepared by auxiliary processes. To use a chilled coolant from the evaporator in the heat exchangers of the process of the Admitted Prior Art, as taught by Oswalt et al., would amount to nothing more than a use of a known material for its intended use in a known environment to accomplish entirely expected result. Further the examiner notes that while there must be some suggestion or motivation for one of ordinary skill in the art to combine the teachings of references to arrive at the claimed invention, it

is not necessary that such be found within the four corners of the references themselves; a conclusion of obviousness may be made from common knowledge and common sense of the person of ordinary skill in the art without any specific hint or suggestion in a particular reference. See *In re Bozek*, 416 F.2d 1385, 1390, 163 USPQ 545, 549 (CCPA 1969). Further, in any obviousness assessment, skill is presumed on the part of the artisan, rather than the lack thereof. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

12. In response to applicant's argument stating various advantages of using heat exchanger of Oswalt et al. to prepare the process coolant of for the apparatus of Admitted Prior Art, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

Basia Ridley
Examiner
Art Unit 1764

BR
February 6, 2005